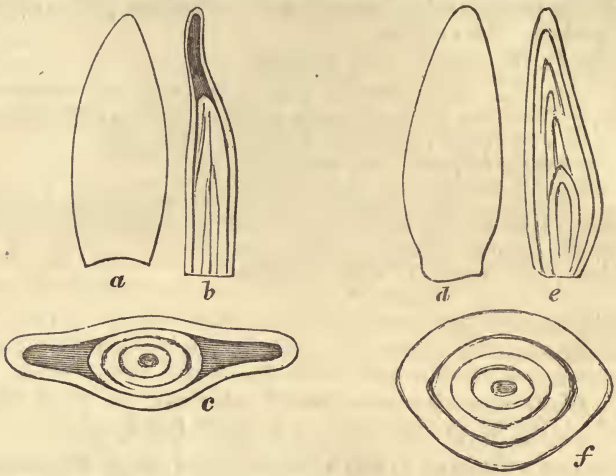
nists who may possess opportunities of extensively testing its validity.

Salix Russelliana. *Salix fragilis.*



a. Leaf-bud of *S. Russelliana*, viewed from the back.
b. Longitudinal section of ditto. *c*. Transverse section of ditto.
d. Leaf-bud of *S. fragilis*, viewed from the back.
e. Longitudinal section of ditto. *f*. Transverse section of ditto.

Shrewsbury, November 8, 1842.

VII.—*Contributions to the Ichthyology of Australia.* By John Richardson, M.D., F.R.S., &c., Inspector of Hospitals, Haslar*.

[Continued from vol. x. p. 34.]

Fish of the Scomberoid family are numerous in the Australian seas, and many came under the observation of Parkinson, Solander, and the Forsters on Cook's first two voyages. Such of them as were sketched by Parkinson and George Forster are commented on in the 'Histoire des Poissons,' and Schneider's quotations from J. R. Forster's notes are also occasionally criticized in that work; but Solander's 'Pisces Australiæ' contains several descriptions of '*Scombri*,' which Cuvier has not found it possible to refer with certainty to any species known to him. Indeed the strong family likeness which prevails among the *Scomberoideæ* renders the detection

* Coloured figures of some of the rare species described in this communication are just published by Dr. Richardson in a work intitled '*Icones Piscium*.' See our Bibliographical Notices.

of precise specific differences proportionably difficult, and, in fact, it is often impossible to elicit even the generic forms from the descriptions of the naturalists of the Linnæan school. The authors of the 'Histoire des Poissons' were therefore undoubtedly right in abstaining from encumbering their great work by uncertain references to Solander's manuscripts; but the ichthyologist who shall hereafter revisit the ports explored by Cook, may wish to know what number of this difficult family he has to look for; and with the recent fish before him, he may find that the subjoined extracts from the 'Pisces Australiæ' will enable him to clear up the synonymy in a way which could scarcely be attempted by the European naturalist who has access to a few discoloured specimens only.

The *Scomber australasicus* (Cuv. et Val.) taken by Messrs. Quoy and Gaimard in King George's Sound, is said to be much like the Mediterranean *pneumatophorus* in general form, to have the angle of the preoperculum marked with diverging streaks, and the numbers of the fin-rays as follows:—

D. 9| — 1|12; A. 2|11, &c.

Another species, *Scomber loo* (Cuv. et Val), which was found by Messrs. Lesson and Garnot at New Ireland, Waigiou and New Guinea, represents the common mackerel of Europe almost exactly in form and in the numbers of its fin-rays, though it attains a larger size. It is ornamented by a series of spots and two lines of a brilliant gold-yellow tint. Solander saw a mackerel in Queen Charlotte's Sound, which he considered to be identical with the European one, and as he says nothing about yellow spots and lines, it is probable that the likeness is still more exact than that of the *Scomber loo*. His very brief notice of the fish is as follows: "*Scomber scombrus* (Linn. Syst. 492. 1.), habitat (Dec. 1, 1769) in sinu Motuaro. Nostratibus paulo majores. B. 7; D. 10| — 1|11; A. 1|11; C. 18; P. 20; V. 1|5." The fin-rays of the European mackerel are stated by Cuvier to be D. 10, 11 or 12| — 1|11; A. 1|11, with five pinnules above and below.

The *Scomber splendens* of Solander ('Pisces Australiæ,' p. 37) and the *Scomber dentex* of the Forsters, which is the "maga" of the natives of Queen Charlotte's Sound, are *Thyrsites*, and very probably the same species. George Forster's figure* of *Scomber dentex* (the *dentatus* of J. R. Forster, as quoted by

* From a reference written with a pencil under this figure, it appears to have been considered by some one as the same with the *Scomber lanceolatus* of Solander; but this is the *Cybium Solandri* of Cuvier and Valenciennes (viii. p. 192), which was taken off Thrumcap Island in the Polynesian Archipelago, and is named in the native language "tatea." The Banksian library contains a figure of it by Parkinson.

Schneider) is compared in the 'Histoire des Poissons' with the *Thyrsites atun* of the Cape of Good Hope. The *Thyrsites altivelis* ('Zool. Proceed.' 1839, p. 99) from Port Arthur, Van Diemen's Land, differs but slightly from the *atun*. [Vide 'Zool. Trans.' vol. ii. p. 118.]

The *Scomber macrophthalmus* of Solander ('Pisces Austr.' p. 44), of which there is a drawing by Parkinson (91), is the GEMPYLUS SOLANDRI of the 'Histoire des Poissons' (viii. p. 215). It was obtained on the coast of Eahei no-mauwee, the northern division of New Zealand. The number of rays is stated by Solander to be according to our notation, D. 18|—1|17, II; A. 1|15, II, which differs from the quotation in the 'Histoire des Poissons,' where the two spurious fins above and below are not supposed to have been included by Solander in his enumeration of the rays. His words are, "Pinna dorsalis posterior 20-radiata, radio primo simplici, reliquis muticis duobus posticis distinctis ideoque spuriis." And "Pinna analis sub pinna dorsali posteriori, illique similis 18-radiata; radio primo spinoso, reliquis muticis; duobus posticis reliquis distinctis, h. e. spuriis." Parkinson's figure indicates the number of spinous rays distinctly, but the articulated rays are not drawn with sufficient precision to show their exact number.

CHORINEMUS FORSTERI, Forster's Chorinemus.

Scomber maculatus, G. Forster, Icon. No. 228. Mus. Brit., J. R. Forster apud Schneider.
Scomber Forsteri, Bl. Schn., p. 26.
No. 30. Mr. Gilbert's list.

This fish is common in all parts of the harbour of Port Essington, and is captured daily in great numbers by the natives, who name it "milinjidne." It appears to be the same species which the Forsters found at New Zealand, and named *maculatus*, and perhaps it is also the same with the *aken parah* of Russell (141) and the *Chorinemus commersonianus* of the 'Histoire des Poissons'; at least the detailed description contained in this work agrees almost exactly with Mr. Gilbert's specimen, the following exceptions being slight and perhaps only apparent.

The length of the snout before the eye is more nearly the fifth part of the length of the head than the fourth; the narrow maxillary dilates and is truncated at its lower extremity; and the scapular bone has an elongated oval shape and not a rectangular one, its ends being much rounded. The supra-scapular is shaped as in *commersonianus*. The upper profile of the head is scarcely curved. There is only a single row of teeth on the lateral limbs of the jaws. The couchant interosseous spine is very evident when the part is dissected; there are three interosseous bones without rays before it,

and the first very short dorsal spine stands upon it. The whole of the branching dorsal and anal rays are connected by a membrane, which is notched before the more posterior rays. The lateral line is slightly arched before the dorsal fin. It makes a small obtuse angle over the middle of the pectoral, not more conspicuous than three or four undulations, which follow at a little distance: after passing the first four jointed rays of the dorsal, the line runs perfectly evenly and directly to the caudal fin.

Rays:—D. 7|—1|19; A. 2—1|17; C. $18\frac{5}{4}$; P. 17; V. 1|5.

Dimensions.	inches.	lines.
Length from tip of snout to end of caudal fin	19	8
——————————— base of ditto	16	4
——————————— beginning of jointed dorsal	8	9
——————————— anus	6	3
——————————— first free dorsal spine	5	4
——————————— edge of gill-cover	3	6
——————————— edge of orbit	0	8
Diameter of the eye	0	8
Length of pectorals	2	2
Height of dorsal and anal	2	6
Depth of caudal fork	2	9
Height of body, about	5	0

The *Caranx trachurus*, Scad or Horse-mackerel, is an almost cosmopolitan fish; or at least, the peculiar characters of the species which inhabit the various districts of the ocean, if they be different, are not very obvious. There are variations of form in the *Trachuri* of the European seas, which appear, when a great number of individuals are examined, to pass into each other by such insensible gradations, that Cuvier hesitates to consider them as permanent, and merely divides the species into three groups of varieties. In the first group, which furnishes the example chosen for description in the 'Histoire des Poissons,' the lateral line is armed with seventy shields, and its oblique bend extends from opposite the beginning of the second dorsal to beneath the tenth ray. The second group comprises individuals having from eighty to eighty-eight shields, of less vertical height, and rather more than half of the lateral line posterior to the bend, which is also more sudden. The third group, which includes individuals possessing from ninety-four to ninety-nine lateral shields, is, in Cuvier's opinion, actually a distinct species, though he does not give it a name. Its members have a more slender body than the ordinary species, a narrower lateral line, which bends suddenly in the middle, and leaves the posterior part just equal to the anterior part, including the bend.

Scad differing very slightly from the European ones, and having from seventy-three to seventy-five lateral shields, are noticed in the 'Histoire des Poissons' (ix. p. 19) as having

been brought from the Cape of Good Hope by Delalande. Others, taken in Shark Bay by Lesson, and at New Zealand and Amboyna by Quoy and Gaimard, had from sixty-eight to seventy-three shields, and their external resemblance to the common species of the British Channel was very close, the bend of the lateral line being the same, and not, as in the Cape variety, more gradual. But some variations in the viscera of the New Zealand examples are detailed in the work above quoted (p. 26).

Mr. Jenyns, in the "Zoology" of the 'Voyage of the Beagle' (p. 68. pl. 14.), has described and figured, under the name of *Caranx declivis*, a scad from King George's Sound which has eighty-one or eighty-two shields, and the bend commencing under the fifth ray of the second dorsal and terminating under the ninth, or almost exactly at the middle of the line. It has the black spot at the opercular notch more or less distinctly seen in all the *Trachuri*, and indeed in most of the horse-mackerels (*Caranx*).

Solander, in his 'Pisces Australiæ,' gives the following account of a *Caranx*. It is not accompanied by a figure, but from the way in which he describes the lateral line, it is probably a *Trachurus*.

"*Scomber clupeoides*. Habitat in oceano australi prope Motuaro. Piscis 8-unciarum lanceolatus, supra medium e viridi- et cæruleo-opalinus, infra ex opalino-argenteus. Macula sublunaris nigra paulo supra angulum laminæ posticæ operculorum. Iris argentea. Pupilla nigra. Linea lateralis late loricata, postice et in cauda acute alteque carinata, in medio pisce descendens. Linea dorsalis ad initium pinnæ dorsi posterioris paulo divaricata. Area postica caudæ lanceolata. Pinna analis in lacuna, e regione ani continuata, recondenda. Supra pinnam analem linea obsolete impressa; forte hæc et linea dorsalis scombri propriæ."

The Australian seas nourish examples of other groups of *Caranx*. Of those which have only small scales on the forepart of their lateral line, no pinnules, little height, and an almost straight form of body, Cuvier remarks that the distinctive marks of most of the species are so obscure that they escape naturalists who have not an opportunity of comparing one with another, and that the synonymy is consequently involved. The *Scomber lutescens* of Solander ('Pisces Austr.' p. 38) is evidently one of this group, and is perhaps different from most of the other members of it, in the greater curvature of the lateral line, though without a figure this is not quite certain.

"Corpus lanceolatum, supra medium e lutescenti-opalinum, subtus ex argenteo-opalinum. Oculi mediocres: iris argentea: pupilla

nigra. Macula nigra ad angulum superiorem operculorum. Pinnæ dorsales colore dorsi absque nitore. Pinnæ pectorales pallidiores. Pinnæ ventrales albidæ. Pinna ani antice albida, postice lutescens. Pinna caudalis lutescens. Pinnulæ spuriæ nullæ. Pectus sub pinnis ventralibus late canaliculatum. Pinna dorsalis anterior fossula recondenda. Linea dorsalis completa paulo pone pinnam dorsalem anteriorem parum descendens. Linea lateralis antice dorso propior, sub initium pinnæ dorsalis posterioris admodum descendens et dein recta ad carinam caudæ extensa. Cauda loricata anceps. Rictus amplus albus. *Habitat* in oceano Australiam alluente, prope Novam Zelandiam, Martii 30, 1770." (Solander.)

The *Scomber trachurus, varietas* (fig. 223, Banks. Lib.), of the Forsters, is also most probably another example of this group: it was taken in Dusky Bay, New Zealand. Broussonnet has added under the drawing a reference to *Scomber dimidiatus* of his MSS.; and some one has also considered it, though incorrectly, as synonymous with the *Scomber micans* of Solander. There is a short notice of it in the 'Histoire des Poissons' (ix. p. 20).

The CARANX GEORGIANUS (Cuv. and Val., ix. p. 85), procured by Messrs. Quoy and Gaimard in King George's Sound, is one of the species having a more elevated body, but still with a straight profile. A specimen from the same locality is described by Mr. Jenyns with more detail in the "Zoology" of the 'Voyage of the Beagle'; and Parkinson's figure, No. 89, and Solander's description of *Scomber micans*, do not appear to differ from it.

"Corpus ovato-oblongum, compressum nitens. Caput mediocre, antice nudum, postice squamosum. Rostrum parum descendens, obtusiusculum. Maxilla superior paulo longior, in ore clauso. Maxilla inferior subtus poris punctata. Os parvum. Dentes in maxillis, lingua, palato et fauce. Dentes maxillares minuti, conici, numerosi serie irregulari dispositi: dentes linguæ et palati acerosi, minuti, pauci: dentes faucium conici plures. Lingua ovata, obtusa alba, antice libera. Oculi parvi; iris e fusco-argentea: pupilla nigra. Nares in medio inter oculos et rostrum, vicinæ, parvæ, oblongæ: anterior paulo major. Branchiarum opercula integra, squamosa. Membrana branchiostega tecta, 7-radiata. Linea lateralis supra pinnas pectorales late arcuata dorso propior, parum carinata, pone illarum apices descendens et dein recta per medium piscem in cauda loricata alte et acute carinata. Præter lineam lateralem linea dorso toto parallela, spatio vix semunciali ab illo remota (ideoque nobis dorsalis), punctulata; alia linea obsoleta, impressiuscula, paulo supra pinnam analem ducta. Regio ani in medio pisce, oblongo-lanceolata, nuda, $\frac{2}{7}$ unc. longa a pinna anali parum remota. Anus majusculus; apertura vaginæ genituræ parva. Cauda brevis, teres, e linea laterali loricata, subanceps, postice dilatata in aream quadratam ad latera carinæ lineæ lateralis. Pinnæ dorsales duæ, anterior spinosa, 8-radiata, intra

cutem dorsi incrassatum elevatum, recipienda. Pinnæ pectorales, falcatæ, paulo pone initium pinnæ analis extensæ, 18-radiatæ, muticæ. Pinnæ ventrales muticæ, oblongæ, acutiusculæ, breves, anum non attingentes, ventri arcte adnatæ. Pinnæ anales duæ; anterior spinosa, bi-radiata, radiis brevibus; posterior 25-radiata, uti pinna dorsalis intra cutem elevatam recipiendæ; radius primus simplex, spinosus cæteris brevior, reliqui mutici. Pinna caudalis bifurca, 20-radiata; lobi lanceolati, acuti, æquales. Squamæ parvæ, adhærentes, tenues, læves, integræ.

"*Color*:—Piscis supra medium e cæruleo-opalinus, infra ex opalino-argenteus, totus nitens. Caput ante oculos pellucido-virescens. Macula majuscula atra paulo supra angulum laminæ posterioris branchiarum. Pinna dorsalis, et pinna analis pallide olivaceæ. Pinnæ pectorales cinerascentes. Pinnæ ventrales albidæ, interdum parum rubentes. Pinna caudalis cinereo-plumbea. Linea dorsalis cyanea. Diameter piscis longitudinalis uncias 18, perpendicularis $5\frac{1}{2}$, transversalis $2\frac{1}{4}$.

"Radii:—Br. 7; D. 8|—1|28; A. 2—1|24; V. 1|5; P. 18; C. 20.

"*Habitat* in oceano Australiæ prope Motuaro." (Solander.)

Representatives of the third division of *Caranx*, 'Les Carangues' (Cuv.), also exist in the seas of Australia. The *Caranx Lessonii* (Cuv. and Val. ix. p. 113) was brought from New Holland by MM. Lesson and Garnot, and is considered by Cuvier to be the *gundi-parah* of Russell, p. 144. The *Caranx speciosus* (Cuv. and Val. ix. p. 130), which inhabits the Red Sea, the Indian Ocean, and the Polynesian Archipelago, was brought by Bougainville (le fils) from New Holland. The *Scomber platinoides* of Solander, of which the only memorial is the following brief notice, is probably a member of this division.

"Sæpe pedalis, totus argenteus, nitidissimus, dorsum parum cærulescens. Iris argentea, pupilla nigra. Macula nigra sublunata postice in angulo laminæ operculi posticæ. Pinnæ parum lutescunt, præcipue pinna analis. *Habitat* Tolaga." (Pisces Austr.)

A pencil reference to *Sc. hippos*, with a mark of doubt, is appended to the MSS. The *Sc. hippos*? of Forster, of which a figure exists in the Banksian Library, and a description in Schneider (p. 28), was taken at Otaheite, and not in New Zealand, as stated in the 'Histoire des Poissons,' where it is named *Caranx forsteri*.

[To be continued.]

VIII.—*Observations on the "Sea-Cup."* By Charles W. Peach, Esq.

[With a Plate.]

Having read in Ellis's 'Essay on the Corallines' that he considered the "Sea-Cup" to be "the ovary of the periwinkle